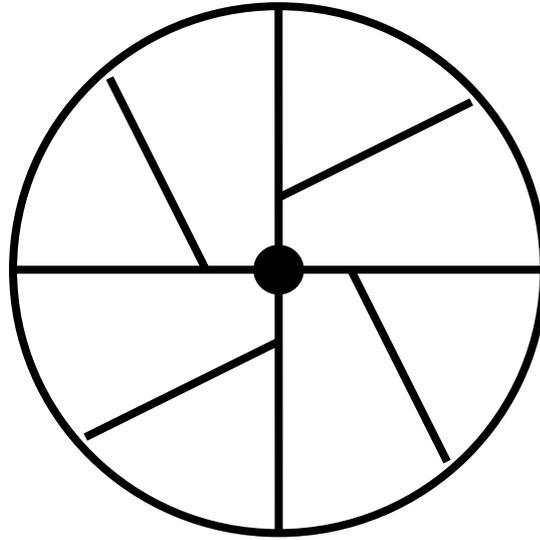# THE TREAD WHEEL FROM CATHERINGTON

This treadwheel was used to draw water from a well which was about 300 feet deep (300 feet ~ 90 metres). It was probably driven by a man or a boy as it is too small for a donkey.

> **How many turns of the wheel**
> **will be needed to raise the bucket?**

To work this out you will need to measure (or estimate) the diameter of the shaft so you can calculate its circumference.

The circumference of the shaft is about 3 times its diameter.

To be more accurate you can use **Circumference = π x diameter.**

Diameter of shaft = _____   **Circumference = _____**

Number of turns = _____ + _____ = _____

> **How far would the boy have to walk**
> **to raise the bucket?**

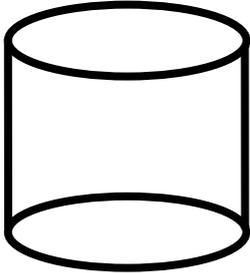First measure the diameter of the wheel, then calculate the circumference.

Diameter of wheel = _____   **Circumference = _____**

He walks = _____ x _____ = _____

How much water was raised each time?

The bucket is barrel shaped. A barrel is fairly close to a cylinder in shape. We can use the formula for the volume of a cylinder to get a good estimate for the volume of the bucket.

Volume of a cylinder = $\pi\, r^2 h$

This means Volume = π x radius² x height
Or π x radius x radius x height

THINK! Should you measure the diameter at the top of the bucket or across the middle? Which will give the best estimate?

Diameter of bucket = _____cm Radius = _____cm Height = _____ cm

Volume = π x _____ x _____ x _____ = _____ cm³

How heavy is the water in the bucket?

This information will help you find out.

1000 cm³ of water is 1 litre and weighs 1 kilogram

For interest. In Imperial measures 1 cubic foot of water is 1 gallon and weighs 10 pounds

The water in the bucket weighs

_____ ÷ _____ = _____ litres = _____ kilograms

THINK ABOUT.....   **How much water was needed every day for the family and the farm?**
How often did the boy have to use the treadwheel?